CLAIMS

1. An aqueous lubricant prepared by suspending or dispersing in water a metal chelate compound comprising a polydentate or multidentate chelate ligand having sulfur as at least one of the coordinating atoms, coordinated to the coordination site of at least one metal species selected from among zinc, manganese, iron, molybdenum, tin and antimony.

2. A multi-ligand metal chelate compound, wherein a polydentate or multidentate chelate ligand having sulfur as at least one of the coordinating atoms coordinates by partially filling the multiple coordination sites of the one or more metal species selected from among zinc, manganese, iron, molybdenum, tin and antimony, while ligands that do not have sulfur as a coordinating atom are coordinated to the remaining coordination sites.

3. A multi-ligand metal chelate compound, and polydentate or multidentate chelate ligand having sulfur as at least one of the coordinating atoms coordinates by partially filling the multiple coordination sites of the one or more metal species selected from among zinc, manganese, iron, molybdenum, tin and antimony, while a hydroxide ion, condensed phosphate, polycarboxylic high molecular activator and/or polyoxycarboxylic acid are coordinated to the remaining

coordination sites.

4. An aqueous lubricant prepared by suspending or dispersing in water a multi-ligand metal chelate compound according to claim 2 or 3.

5. An aqueous lubricant prepared by adding a soluble condensed phosphate salt, a soluble polycarboxylic high molecular activator and/or a soluble polyoxycarboxylic acid salt to an aqueous lubricant according to claim 1 or 4.

6. A process whereby a metal material on which a phosphate film has already been formed is immersed in an aqueous solution of a multidentate or polydentate chelate ligand having sulfur as at least one of the coordinating atoms, so that said chelate ligand reacts with zinc ions and/or iron ions in said phosphate film to produce a crystalline multi-ligand metal chelate compound on said phosphate film.

7. A process whereby a metal material on which a phosphate film has already been formed is immersed in an aqueous lubricant according to claim 4 or 5, and a ligand which is not a ligand having sulfur as a coordinating atom reacts with zinc ions and/or iron ions in said phosphate film to produce a crystalline polynuclear metal chelate compound on said phosphate film.

8. A method of using an aqueous lubricant according to claim 1, 4 or 5, in which prior to plastic working of a metal material, the aqueous lubricant according to claim 1, 4 or 5 is applied to either or both surfaces of the metal material and the molding surface of ~~a metal~~ mold to form lubricating films on those surfaces, thus allowing plastic working of the metal material with a lubricating film formed on the surface.